

# PATENT SPECIFICATION

DRAWINGS ATTACHED

849,613



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## COMPLETE SPECIFICATION

### An Improved Machine for Drying Copra

I, GORDON ALBERT GRAY, a British subject of 11 Eckel Avenue, Maraval, Port of Spain, Trinidad, British West Indies, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed to be particularly described in and by the following statement:—

This invention relates to a machine for drying Copra and like materials by blowing hot air through a casing containing the material to be dried.

The object of the invention is to provide an improved machine which will dry such materials sufficiently uniformly to obtain a product fit for marketing and yet avoids the use of a mechanism for stirring or agitating the material during drying.

According to the invention this is achieved by providing a machine comprising a casing containing a screen for supporting a layer of material to be dried and a heating and blowing apparatus connected to the casing by a system of ducts capable of delivering hot air either to a space in the casing above the screen or to a space in the casing below the screen and discharging air that has passed through the layer of material either from the space below the screen or from the space above the screen so as to enable the direction of flow of the hot air to be reversed at intervals to cause it to flow alternately upwards and downwards through the layer. The machine is preferably arranged to recirculate used air through the heating and blowing apparatus so as to conserve heat and regulate the drying action and has a vent for discharging a proportion of the used air from the drying casing and an air inlet for admitting fresh air to the air heating and blowing apparatus.

The invention will be fully understood from the following more detailed description with reference to the accompanying drawings in which:—

(Price 3/6)

Fig. 1 is a side elevation of one example of a machine constructed according to the invention.

Fig. 2 is a corresponding elevation as seen from the other side.

Fig. 3 is a plan.

Fig. 4 is a side elevation of a modified arrangement, and

Fig. 5 is a plan of the arrangement shown in Fig. 4.

As shown in the drawings, the machine comprises a drying chamber having a cylindrical casing 1 which may be made of sheet metal bolted together by sections, and a bottom formed by an open wheel-like frame-work 2 of angle irons or the like. It is closed at the top by a cover 3 which is composed of removable sector-shaped sections 4.

The casing 1 is designed to receive a charge of material to be dried upon a screen 5 which forms as it were a floor at the bottom of the casing 1. This screen 5 may consist of a wire mesh, or perforated metal or wood and is supported by the wheel-like framework 2.

In order to fill the drying chamber with material one or more of the sector-shaped sections 4 are removed and the material allowed to fall onto the screen 5.

The casing 1 also has two double doors 10 at one side which can be opened as shown in Fig. 3 to enable the dried material to be discharged.

The drying chamber is raised off the ground level and supported by a cylindrical air chamber 12 of the same diameter as the casing 1 of the drying chamber.

The drying chamber is supplied with high velocity hot air from an external supply. In the drawings, a hot air plant which includes a blower for blowing the air through a heat-exchanger is indicated generally by the reference numeral 18. It is arranged to blow hot air into the space 12 beneath the screen 5 through an inlet duct 19, and to withdraw 90

used air from the casing 1 through an outlet 20 in the cover 3 and a duct 16a. The air is thus recirculated through the air heater. To provide for the discharge of moisture-laden air when necessary, an auxiliary air outlet 21 is provided in the lid 3. The outlets 20 and 21 are provided with valves or regulators 22a and 22b which can be operated to vary the proportion of air recirculated as may be required. When moisture-laden air is discharged through outlets 20 and 21 instead of being recirculated by duct 16a through the heater, fresh air enters the system through an inlet provided at 17 (Fig. 2). Fresh air and recirculated used air can thus be used in required proportions.

To enable the direction of flow of the hot air through the drying casing to be reversed an auxiliary duct 15 is provided leading from the outlet of the blower to the outlet 20 and an auxiliary duct 16b is provided leading from the air chamber 12 to the inlet of the hot-air plant 18. The ducts 19 and 16a are controlled by valves 14 and 12a respectively, and the ducts 15 and 16b are controlled by valves 13 and 11 respectively.

In the use of the apparatus, the drying chamber is charged with a sufficient quantity of material to cover the screen 5 to a convenient depth and the material is then dried by circulating hot air at high velocity through it by means of the hot air plant 18, first using the "forward" direction of air flow i.e., through the ducts 19 and 16a so that the hot air flows upwards through the layer of material on the screen 5. For this purpose the valves 12a and 14 are held open and the valves 11 and 13 closed.

After the material has been drying for a certain period of time in the manner explained above, the hot air flow is reversed without having to stop the operation of the hot air plant or the progress of the drying by opening the valves 11 and 13 and closing the valves 12a and 14. The valves 22a and 22b must also be closed during reverse flow. An auxiliary outlet 22c for moist air controlled by a suitable regulator is provided in the wall of the air chamber 12 to provide for the discharge of moisture-laden air during reverse flow.

After a certain period of drying with the air flow in the reverse direction it is optional

for the operator to change the direction as many times as is conducive to a good final result in treated material. The material need not be handled or moved during the entire drying process.

Figs. 4 and 5 of the drawings show a slightly modified arrangement in which the auxiliary duct 15 communicates with the space above the layer of material to be dried through a separate opening in the wall of the casing 1 instead of through the outlet 20. Otherwise the arrangement shown in Figs. 4 65 and 5 is similar to that shown in Figs. 1 to 3, and corresponding parts are marked with the same reference numerals.

Thermometers may be mounted in the air spaces above and below the material being dried to enable the progress of the drying operation to be checked by the difference shown between the temperature of the air before and after passing through the material to be dried. 75

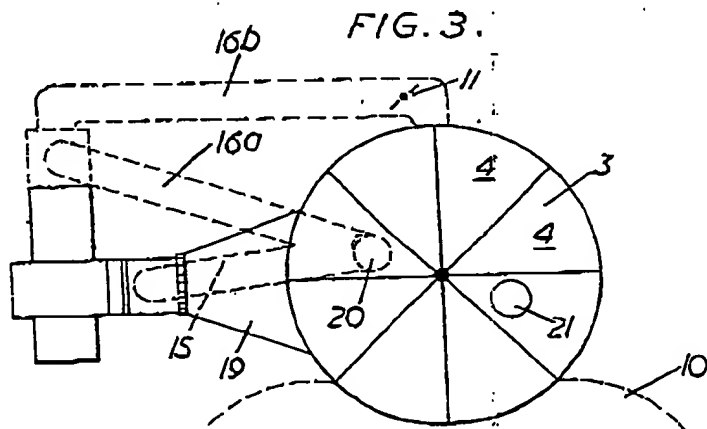
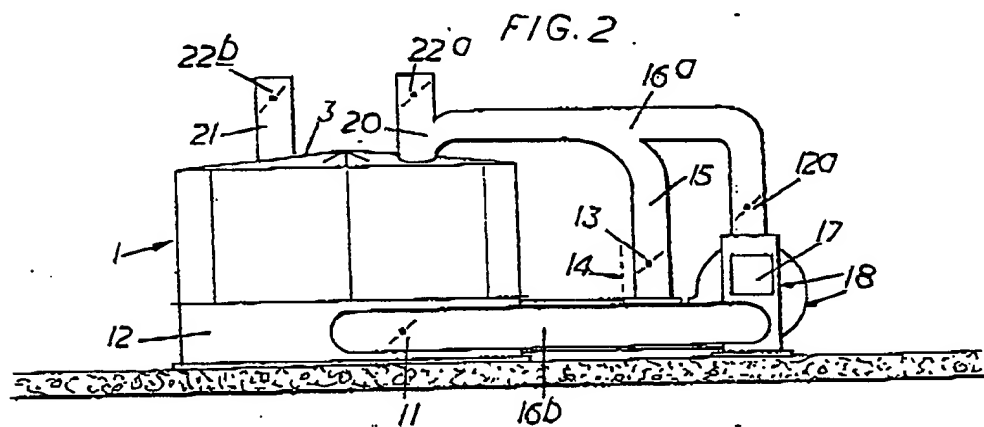
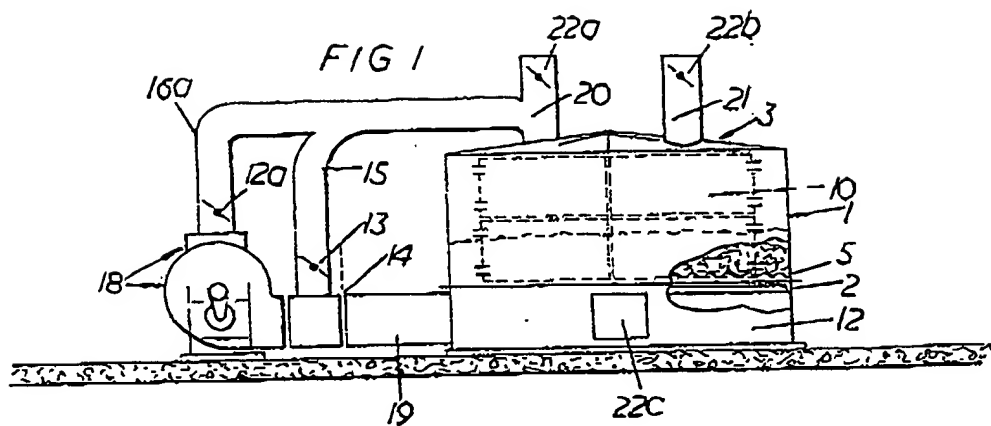
#### WHAT I CLAIM IS:—

1. A machine for drying Copra comprising a casing containing a screen for supporting a layer of material to be dried and a heating and blowing apparatus connected to the casing by a system of ducts capable of delivering hot air either to a space in the casing above the screen or to a space in the casing below the screen and discharging air that has passed through the layer of material either from the space below the screen or from the space above the screen so as to enable the direction of flow of the hot air to be reversed at intervals to cause it to flow alternately upwards and downwards through the layer. 90

2. A machine according to Claim 1 arranged to recirculate used air through the heating and blowing apparatus and having a vent for discharging a proportion of the used air from the casing and an air inlet for admitting fresh air to the heating and blowing apparatus. 95

3. A machine for drying Copra substantially as described with reference to Figs. 1 to 3 or Figs. 4 and 5 of the accompanying drawings. 100

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2 SHEETS

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the Original on a reduced scale.

SHEETS 1 &amp; 2

FIG. 4.

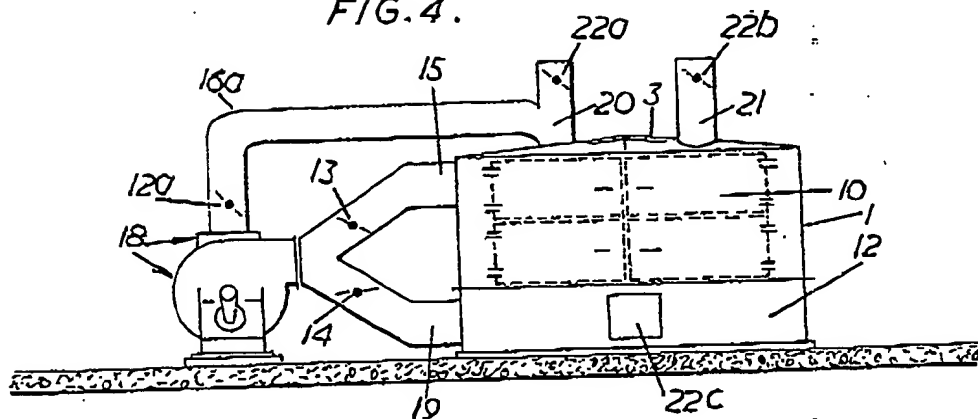
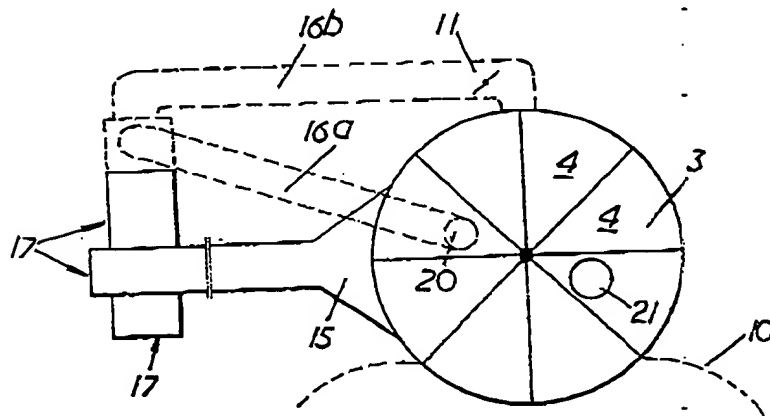


FIG. 5.



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SHEETS 1 & 2

